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Note, by E. B. Seitz.—The value of g, in Mr. Baker's solution, p. 25, may be found as follows:

Let $g = u_n$; then $u_n = u_{n-1} \pm 1$ . . . (1), and $u_{n-1} = u_{n-2} \mp 1$, . . . (2) the upper sign being used when n is odd, and the lower when n is even. Adding (1) and (2), we have $u_n - u_{n-1} - 2u_{n-2} = 0$, an equation in Finite Differences, whose solution gives $u_n = C_1 . 2^n + C_2(-1)^n$. . . . . (3)

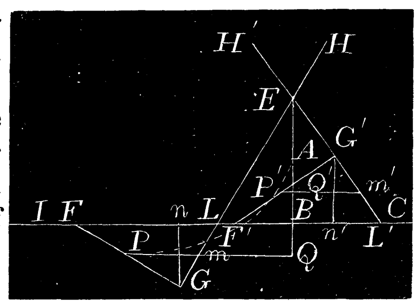
When $n = 1$, $u_1 = 2C_1 - C_2 = 1$ . . . (4), and when $n = 2$, $u_n = 4C_1 + C_2 = 1$ . . . (5). From (4) and (5) we find $C_1 = \frac{1}{3}$, and $C_2 = -\frac{1}{3}$; therefore $g = u_n = \frac{1}{3}(2^n \pm 1)$, the double sign being used as above. Hence the angles of the nth triangle are

$$\tfrac{1}{3}\pi \pm (\tfrac{1}{2})^n(\tfrac{1}{3}\pi - A), \quad \tfrac{1}{3}\pi \pm (\tfrac{1}{2})^n(\tfrac{1}{3}\pi - B), \quad \tfrac{1}{3}\pi \pm (\tfrac{1}{2})^n(\tfrac{1}{3}\pi - C).$$

[Mr. Baker has sent a "Revised Solution" of the question, in which he represents g by the same formula obtained above, and also notices the error in the table, pointed out by Prof. Johnson, but our space will not permit its publication.]

ANSWER TO QUERY (SEE P. 176, VOL. IV), BY THE EDITOR.

From the fixed point E draw a line EAB perpendicular to the fixed line CI and intersecting it in B, at any distance a from the point E, and let A represent the middle point of EB.



Let FGH be any position of the right angle, the side GH intersecting the line CI in L, and let the fix'd length of $GE = a$; then, to find the locus of P, the middle point of GF, draw PQ perpend'ular to AB, intersecting the side GH in m; draw Gn perpendicular to CI, and put $AQ = x$ and $PQ = y$.

Because $AE = \frac{1}{2}a$, $EQ = \frac{1}{2}a + x$, and $BQ = \frac{1}{2}a - a + x = x - \frac{1}{2}a$; $\therefore$ $Gn = 2(x - \frac{1}{2}a)$ and $Fn = \sqrt{\{a^2 - [2(x - \frac{1}{2}a)]^2\}} = \pm 2\sqrt{(x^2 - ax)}$.

Hence, from the similar triangles FnG and EQM, and FnG and PGm,

$$Fn : Gn :: EQ : Qm, \text{ or } 2\sqrt{(x^2-ax)} : 2(x-\tfrac{1}{2}a) :: x+\tfrac{1}{2}a : Qm = \frac{x^2 - \frac{1}{4}a^2}{\sqrt{(x^2-ax)}},$$

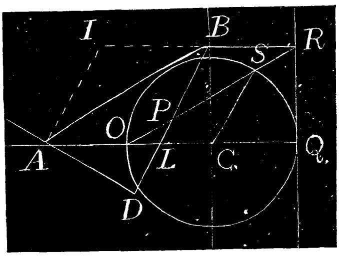
$$Fn : FG :: PG : Pm, \text{ or } 2\sqrt{(x^2-ax)} : \quad a \quad :: \quad \tfrac{1}{2}a \quad : Pm = \frac{\frac{1}{4}a^2}{\sqrt{(x^2-ax)}}.$$

$$\text{But } Qm + Pm = y = \frac{x^2 - \frac{1}{4}a^2}{\sqrt{(x^2-ax)}} + \frac{a^2}{\sqrt{(x^2-ax)}} = \frac{x^2}{\sqrt{(x^2-ax)}}; \therefore y^2 = \frac{x^3}{x-a},$$

which is the equation to the cissoid.

[This query was also answered, differently, by Mr. Seitz, of Greenville, Ohio, Prof. T. A. Smith, of Beloit, Wisconsin, and by Professors Scheffer and Johnson. Prof. Johnson, besides his own demonstration, has sent the follwing, taken from Briot and Bouquet.]

A being the fixed point and BC the fixed line, and ADB the right angle of which the side $BD = AC = 2a$. Let P and O be the middle points of BD and AC. Draw a circle with centre C and radius a and draw a tangent at Q parallel to BC; also draw the line BR parallel to AQ. ABD and ABC are equal right triangles, hence if AC and BD meet in L, ABL is an isosceles tirangle and AO being equal to BP, OP is parallel to AB and P lies on the line OR. Let this line cut the circle in S and join SC, BPR and OCS are then equal isosceles triangles; hence $OS = PR$ and P describes a cissoid according to the usual definition.



To this is added the following construction for the tangent to a cissoid.

Draw BI perpendicular to DC and AI to AD, then their intersection I is the "instantaneous center" of the motion, and IP is normal to the path of P that is to the cissoid.

SOLUTIONS OF PROBLEMS IN NUMBER ONE.

SOLUTIONS of problems in number one have been received as follows:

From Henry C. Allen, 188; George H. Bangs, 188, 189; Marcus Baker, 188; George Eastwood, 195; A. S. Hathaway, 189, 190, 191; W. E. Heal, 190, 191; Dr. David S. Hart, 189, 190; Prof. J. H. Kershner, 187, 188, 189; Christine Ladd, 187; Prof. H. T. J. Ludwick, 192; Prof. D. J. Mc. Adam, 188, 194; Artemas Martin, 192; Prof. Orson Pratt, 190; P. Richardson, 189; Prof. J Scheffer, 188, 189, 190, 194, 195; E. B. Seitz, 187, 188, 190, 192, 193; I. H. Turrell, 187.

[In proposing 188 it shonld have been stated that the proposer desired a solution which should be independent of Calculus.]

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187. "Six circles may be described each of which shall touch four of the others. Prove that the lines, joining the centers of the non-touching pairs, are concurrent."